

REMARKS

Claims 1-25 remain pending in the present application. Applicants greatly appreciate the thorough review of the present application and the allowability of claim 23. Clarifying amendments to claims 1, 11, 14, 15, 21 and 25 have been made to more clearly recite the unique and novel features of the present invention and to place all of the claims of the present application in condition for allowance. Accordingly, reconsideration and allowance of the claims in the present application as amended are earnestly solicited in view of the following remarks.

Claims 1-22, 24 and 25 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,898,179 to Smick et al. This rejection is respectfully traversed.

Claims 1, 11, 14, 15 and 25 are respectively directed to methods and apparatus for determining a direction or parallelism of a beam. The claims have been amended to recite that creating an adjusted intensity profile is performed independent from detecting the variation in the adjusted intensity profile and is downstream from the creation of the adjusted intensity profile. As described in the embodiments of the present invention on page 7 of the present specification, the beam modifier 2 (for creating the adjusted intensity profile) and the detector 3 (for detecting variations in the adjusted intensity profile) may be moved and either or both may be fixed in place. By independently creating and detecting the adjusted intensity profile, an easy and rapid measurement of the ion beam direction and parallelism is realized while the ion implantation system is configured.

Smick et al. is directed to an implantation control system as illustrated in Figs. 5 and 7. The two movable Faraday assemblies, a downstream Faraday 16 and an upstream Faraday 72, have the same freedom of motion for allowing identical measurements of the ion beam 13 both upstream and downstream inside the vacuum chamber 24. The phase angle difference between measurements of the beam position in the upstream and downstream Faradays 16 and 72, which are controlled together, is used to calculate the deviation from parallel for the scanned rays of the ion beam 13. The phase angle measurements are made when the work piece holder is moved out of the beam path so that measurement of the beam parallelism is performed when the system is not configured for implantation, during set-up for instance. In contrast to Smick et al., the methods and apparatus claimed in the present application determine both direction and

parallelism of the beam in-situ. Specifically, Smick et al. do not create an adjusted intensity profile independent from detecting variations in the intensity of the profile. By providing such independent control, the system and methods claimed in the present application realize easy and rapid in-situ measurement and control of the ion beam direction and parallelism when the system is configured for implantation. Accordingly, it is respectfully submitted that claims 1-22, 24 and 25 of the present application patentably define over Smick et al.

In view of these amendments and for all of the above stated reasons, it is respectfully submitted that all of the outstanding rejections have been overcome. Therefore, it is requested that claims 1-22, 24 and 25 along with allowed claim 23 of the present application be passed to issue.

In the event that the present application is not placed in condition for allowance, it is respectfully requested that these amendments be entered for the purpose of appeal.

If any issues remain unresolved, the Examiner is requested to telephone the undersigned attorney.

Please charge any additional fees or credit any overpayments to deposit account No. 50-0896.

Respectfully submitted,
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